REMARKS

The remarks presented herein attend to all outstanding issues in the pending non-final Office Action of December 30, 2004. Claims 1-39 remain pending in this application, of which claims 1, 15, 24 and 31 are independent.

Claims 1, 15, 24 and 31 have been amended to recite a physical space separating the electrical conductor from the surface of the object being de-iced. Support for this amendment may be found, for example, at p. 9, lines 12-13; p. 9, lines 26-28; p. 10, lines 24-25; FIG. 2; FIG. 4; and FIGS. 6-9.

Rejections under 35 U.S.C. §102

Claims 1, 2, 4-7,12-16, 19-20, 24-27 and 29-37 stand rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Number JP411332074 granted to Shimada et al. (hereinafter "Shimada").

To anticipate a claim, Shimada must teach every element of the claim and "the identical invention must be shown in as complete detail as contained in the ... claim." *MPEP 2131* citing *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989). Shimada does not teach every element of claims 1, 2, 4-7, 12-16, 19-20, 24-27 and 29-37.

Shimada discloses a method of melting ice and snowfall from an overhead power transmission line 1 by applying high frequency of 2,350 to 2,550 MHz to the overhead power transmission line 1. Shimada discloses that the high frequency current is added to the overhead power transmission line 1 by a 'high frequency applying coil 5' that carries a current from a high frequency transmission circuit 4. Shimada also discloses that power for the high frequency transmission circuit 4 is from the overhead power transmission line via a 'pick up power source 2'. The system of Shimada thus de-ices only the overhead power transmission line 1.

Claim 1 recites a system for de-icing a surface of a cableway system component, and requires the following elements:

(a) an electrical conductor proximate to, but not in contact with, the surface;

(b) an AC power source for providing a high-frequency AC voltage in the electrical conductor that generates a high-frequency alternating electric field at the surface sufficient to melt ice at the surface.

Shimada fails to disclose, at least, (a) an electrical conductor proximate to, but not in contact with, the surface. In fact, Shimada's invention would be rendered inoperative if the conductor, 'high frequency applying coil 5', and the overhead power transmission line 1 were not in contact. The apparatus of Shimada is clearly different from that of claim 1. Shimada cannot, therefore, anticipate claim 1.

Reconsideration of claim 1 is respectfully requested.

Claims 2, 4-7 and 12-14 depend from claim 1 and benefit from like argument. However, these claims have additional features that patentably distinguish over Shimada. For example, claim 2 recites the cableway system component functions as an electrical sink for the alternating electric field. The Examiner asserts that the 'pick up power source part 2' of Shimada operates as a sink. However, nowhere does Shimada disclose this. Claim 5 recites an electrical sink, the electrical sink located proximate to the electrical conductor to increase the strength of the alternating electric field at the surface. As argued above, Shimada does not disclose or suggest an electrical sink, let alone that the electrical sink is proximate to the electrical conductor to increase the strength of the alternating electric field at the surface. Claim 6 recites the surface is disposed between the electrical conductor and the electrical sink. Claim 7 recites the electrical conductor is disposed at a distance of about from 0 to 30 cm from the electrical sink. As argued above, Shimada does not disclose or suggest an electrical sink, and therefore cannot anticipate claims 6 or 7. Claim 12 recites the cableway system component is a cableway. Shimada does not disclose a cableway. Claim 13 recites the cableway system component is a cableway system tower. The Examiner asserts that Shimada would inherently use a tower to

connect the power lines to it. However, Shimada does not disclose or suggest removing ice from a tower.

Reconsideration of claims 2, 4-7 and 12-14 is respectfully requested.

Claim 15 recites a system for melting ice on a cableway system component, and includes the following elements:

(a) a first electrical conductor disposed at a distance of about from 0 to 30 cm from the ice wherein a physical space separates the first electrical conductor from the cableway system component, and

(b) an AC power source for providing a high-frequency AC voltage in the first electrical conductor so that the AC voltage generates a high-frequency alternating electric field in the ice.

Shimada fails to disclose, at least, (a) which recites a physical space separating the first electrical conductor from the cableway system component. Shimada's invention would be rendered inoperative by such a physical space. The apparatus of Shimada is clearly different from that of claim 15. Shimada cannot, therefore, anticipate claim 15.

Reconsideration of claim 15 is requested.

Claims 16 and 19-20 depend from claim 15 and benefit from like argument. However, these claims have additional features that patentably distinguish over Shimada. For example, claim 16 recites an electrical sink, the electrical sink disposed at a distance of about from 0 to 30 cm from the first electrical conductor to increase the strength of the alternating electric field. As argued above, Shimada does not disclose an electrical sink, let alone that an electrical sink can be located at a distance of about 0 to 30 cm from the first electrical conductor to increase the strength of the alternating electric field. Shimada cannot, therefore, anticipate claim 16. Claim 19 recites the ice covers a surface of an object being de-iced, and the electrical sink is integral with the object. As argued above, Shimada does not disclose an electrical sink. Further, in Shimada, the object being deiced is a power transmission line, and therefore it cannot include an integral sink as required by claim 19.

Reconsideration of claims 16 and 19-20 is respectfully requested.

Claim 24 recites a method for de-icing a surface of a cableway system component, including a step applying a high-frequency AC voltage to an electrical conductor that is located proximate to the surface, to generate a high-frequency alternating electric field that melts ice at the surface, wherein a physical space separates the electrical conductor from the surface. As argued above, Shimada does not disclose a physical space separating the electrical conductor from the surface. Shimada cannot, therefore, anticipate claim 24.

Reconsideration of claim 24 is requested.

Claims 25-27 and 29-30 depend from claim 24 and benefit from like argument. However, these claims have additional features that patentably distinguish over Shimada. Claim 25 recites applying high-frequency AC voltage including flowing AC current with a frequency in a range of about from 60 kHz to 100 kHz. Shimada discloses a frequency range of 2,350 to 2,550 MHz (i.e., 2.35-2.55 GHz) which is not in the range 60 KHz - 100 KHz of the immediate application. Claim 26 recites applying AC voltage with a voltage in a range of about from 3 kV to 15 kV. Nowhere does Shimada disclose an AC voltage, let alone the voltage range of about from 3 kV to 15 kV as required by claim 26. Claim 27 recites separating the electrical conductor from the cableway system component using an electrically insulating spacer. Nowhere does Shimada disclose or suggest electrically insulating spacers for separating the electrical conductor from the cableway system component. Additionally, Shimada's invention would be inoperable if his conductor, the 'high frequency applying coil 5', was electrically insulated from the overhead power transmission line 1. Claim 29 recites providing an electrical sink, wherein the surface is located between the electrical conductor and the electrical sink. As argued above, Shimada does not disclose an electrical sink. Claim 30 recites the cableway system component is electrically conductive and further includes the steps of:

(a) connecting an AC power source to the cableway system component;

(b) connecting the AC power source to the electrical conductor; and

(c) connecting the AC power source to the electrical ground, so that the AC power source energizes the cableway system component and the electrical conductor at the same AC potential but 180 degrees out of phase from each other.

Shimada does not disclose or suggest energizing a cableway system component and an electrical conductor with the same AC potential but 180 degrees out of phase from each other. Further, Shimada does not disclose or suggest connecting the AC power source to ground as required by step (c) of claim 30. Shimada cannot anticipate claim 30.

Reconsideration of claims 25-27 and 29-30 is respectfully requested.

Claim 31 recites a method for melting ice on a cableway system component, including an element of applying a high-frequency AC voltage to a first electrical conductor that is located at a distance of about from 0 to 30 cm from the ice, wherein a physical space separates the first electrical conductor from the cableway system component, to generate a high-frequency alternating electric field that melts the ice. As argued above, Shimada does not disclose a physical space separating the first electrical conductor from the cableway system component, as specified by the immediate application.

Reconsideration of claim 31 is requested.

Claims 32-37 depend from claim 31 and benefit from like argument. However, these claims have additional features that patentably distinguish over Shimada. For example, claim 32 recites applying high-frequency AC voltage including flowing AC current with a frequency in a range of about from 60 kHz to 100 kHz. Shimada discloses a frequency range of 2,350 to 2,550 MHz (i.e., 2.35-2.55 GHz) which is not in the range 60 KHz - 100 KHz of the immediate application. Claim 33 recites applying AC voltage with a voltage in a range of about from 3 kV to 15 kV. Nowhere does Shimada disclose applying an AC voltage in a range of about from 3 kV to 15 kV. Claim 34 recites providing an electrical sink within a distance of about from 0 to 30 cm from the first electrical conductor. Nowhere does Shimada disclose an electrical sink. Claim 35 recites the ice is located between the electrical conductor and the electrical sink. As argued

above, Shimada does not disclose an electrical sink. Claim 36 recites the ice covers a surface of an object being de-iced, and the electrical sink is integral with the object. As argued above, Shimada does not disclose an electrical sink. Further, since in the system of Shimada, the ice forms on a power transmission line, an electrical sink cannot be integral with the power transmission line.

Reconsideration of claims 32-37 is respectfully requested.

In view of the above remarks, Applicants contend that claims 1, 2, 4-7,12-16, 19-20, 24-27 and 29-37 are allowable over Shimada. Reconsideration of claims 1, 2, 4-7,12-16, 19-20, 24-27 and 29-37 is respectfully requested.

Rejections under 35 U.S.C. § 103

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimada in view of U.S. Patent Number 6,043,471 granted to Wiseman et al. (hereinafter "Wiseman"). Respectfully we disagree.

When applying 35 U.S.C. §103, the following tenets of patent law must be adhered to:

(a) The claimed invention must be considered as a whole;

(b) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(c) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and

(d) Reasonable expectation of success is the standard with which obviousness is determined. MPEP §2141.01, *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1134 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

In addition, it is respectfully noted that to substantiate a *prima facie* case of obviousness the initial burden rests with the Examiner who must fulfill three requirements. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a

reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. MPEP § 2143, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As argued above, Shimada does not substantially disclose the claimed invention.

Wiseman discloses a method for inductively heating a workpiece; the immediate application does not teach or require inductive heating. The immediate application teaches an apparatus and method for melting ice; Wiseman does not. Therefore, Wiseman is non-analogous art to the immediate application; it would not have been obvious to combine Wiseman and Shimada as required under 35 U.S.C. § 103(b). However, even when combined, Shimada and Wiseman do not render claim 8 obvious.

Claim 8 depends from claim 1. Claim 1 recites a system for de-icing a surface of a cableway system component, including the following elements:

(a) an electrical conductor proximate to, but not in contact with, the surface;

(b) an AC power source for providing a high-frequency AC voltage in the electrical conductor that generates a high-frequency alternating electric field at the surface sufficient to melt ice at the surface.

As argued above, Shimada fails to disclose, at least, (a) an electrical conductor proximate to, but not in contact with, the surface. Shimada's invention would be rendered inoperative if the conductor, 'high frequency applying coil 5', and the overhead power transmission line 1 were not in contact.

Claim 8 recites the cableway system component is electrically conductive and is connected to the AC power source, the electrical conductor is connected to the AC power source, so that the AC power source energizes the cableway system component and the electrical conductor at the same AC potential but 180 degrees out of phase from each other. Neither Shimada nor Wiseman disclose or suggest energizing the cableway system component and the electrical conductor at the same AC potential but 180 degrees out of

phase from each other. The Examiner asserts that Wiseman discloses a heating system with phase control in which MOSFET Q3 is 180 degrees out of phase with respect to MOSFET Q2. See Wiseman, col. 6, lines 27-34. However, in Wiseman, the phase of MOSFET Q4 relative to MOSFET Q1, and the phase of MOSFET Q3 relative to MOSFET Q2, determines the pulse width of the signal applied to the primary of transformer T1. See Wiseman col. 6, lines 14-16. Wiseman does not disclose or suggest two outputs with the same AC potential but 180 degrees out of phase. Therefore, even when combined, Shimada and Wiseman do not render claim 8 obvious.

Reconsideration of claim 8 is respectfully requested.

Claims 3, 9-10, 17-18, 25-26, and 28-37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimada. Respectfully we disagree.

Contrary to the Examiner's assertion, and as argued above, Shimada does not substantially teach the claimed invention. As argued above, the Shimada does not teach or suggest a physical space separating the electrical conductor from the surface of a cableway system component.

Claim 3 depends indirectly from claim 1, argued above, and further recites the cableway system component is connected to electrical ground. The Examiner asserts that connecting the system components to electrical ground is conventional in the art. Contrary to the Examiner's assertion, it is not obvious to connect the power transmission line to ground. In fact, if the power transmission line of Shimada is connected to ground, not only is deicing not possible, the fundamental operation of the power transmission line is inhibited. Shimada cannot, therefore, render claim 3 obvious.

Claim 9 recites the AC power source provides high-frequency AC voltage with a frequency in a range of about from 60 kHz to 100 kHz. Shimada discloses a frequency range of 2,350 to 2,550 MHz (i.e., 2.35-2.55 GHz) which is not in the range 60 KHz - 100 KHz of the immediate application. See at least: page 3, lines 13-15; page 4, lines 8-10; page 6, lines 20-21; and page 7, lines 9-10. It is not obvious to adjust a frequency from a gigahertz range to a kilohertz range to melt ice. Further, there is no motivation to modify

the frequency of Shimada, since it already operates to melt ice from the power transmission line.

Claim 10 depends from claim 1 and recites the AC power source provides high-frequency AC voltage with a voltage in a range of about from 3 kV to 15 kV. Shimada does not disclose or suggest a voltage range. In fact, the voltage range of Shimada is probably dependent upon operation of the power transmission line, and therefore not selectable. Shimada cannot therefore render claim 10 obvious.

Claim 17 depends from claim 16 and recites the electrical sink is connected to electrical ground. As argued above, Shimada does not disclose or suggest an electrical sink. Further, if as asserted by the Examiner in paragraph 2 of the immediate office action, system component 2 of Shimada functions as a sink, connecting system component 2 to ground effectively short circuits power transmission line 1 to ground.

Claim 18 depends from claim 17 and recites the ice is disposed between the first electrical conductor and the electrical sink. As argued above, Shimada does not disclose an electrical sink and therefore cannot render claim 18 obvious. Claim 25 recites applying high-frequency AC voltage including flowing AC current with a frequency in a range of about from 60 kHz to 100 kHz. Shimada discloses a frequency range of 2,350 to 2,550 MHz (i.e., 2.35-2.55 GHz) which is not in the range 60 KHz - 100 KHz, and it is not obvious to adjust a frequency from a gigahertz range to a kilohertz range to melt ice. Claim 26 depends from claim 24 and recites applying AC voltage with a voltage in a range of about from 3 kV to 15 kV. Shimada does not disclose a voltage range at all and therefore cannot render claim 26 obvious. Claim 28 depends from claim 24 and recites connecting the cableway system component to electrical ground. As argued above, the cableway system component has a surface from which ice is removed. Thus, in the system of Shimada, the power transmission line, from which ice is melted, would be required to be connected to ground and this is clearly not reasonable, as this would prevent transmission of power through the power transmission line. Claim 29 depends from claim 24 and recites providing an electrical sink, wherein the surface is located between the electrical conductor and the electrical sink. The Examiner asserts, in paragraph 2 of the

immediate office action, that Shimada's system component 2 functions as an electric sink. Respectfully we disagree. Claim 30 recites the cableway system component is electrically conductive and further includes the steps of connecting an AC power source to the cableway system component, connecting the AC power source to the electrical conductor, and connecting the AC power source to the electrical ground, so that the AC power source energizes the cableway system component and the electrical conductor at the same AC potential but 180 degrees out of phase from each other. Shimada does not disclose a cableway system component and cannot therefore suggest energizing a cableway system component and an electrical conductor with the same AC potential but 180 degrees out of phase from each other.

Claim 31 recites a method for melting ice on a cableway system component, including an element of applying a high-frequency AC voltage to a first electrical conductor that is located at a distance of about from 0 to 30 cm from the ice, wherein a physical space separates the first electrical conductor from the cableway system component, to generate a high-frequency alternating electric field that melts the ice. As argued above, Shimada does not disclose a physical space separating the first electrical conductor from the cableway system component, and it would not be obvious to incorporate such a physical space. Claim 32 recites applying high-frequency AC voltage including flowing AC current with a frequency in a range of about from 60 kHz to 100 kHz. Shimada discloses a frequency range of 2,350 to 2,550 MHz (i.e., 2.35-2.55 GHz) which is not in the range 60 KHz - 100 KHz, and it is not obvious to adjust a frequency from a gigahertz range to a kilohertz range to melt ice. Claim 33 recites applying AC voltage with a voltage in a range of about from 3 kV to 15 kV. Shimada does not disclose a voltage range at all and therefore cannot render claim 33 obvious. Claim 34 recites providing an electrical sink within a distance of about from 0 to 30 cm from the first electrical conductor. Nowhere does Shimada disclose an electrical sink. Claim 35 recites the ice is located between the electrical conductor and the electrical sink. Again, Shimada does not disclose an electrical sink. Claim 36 recites the ice covers a surface of an object being de-iced, and the electrical sink is integral with the object. As argued above, Shimada

does not disclose an electrical sink. Further, since in the system of Shimada, the ice forms on a power transmission line, an electrical sink cannot be integral with the power transmission line.

In view of the above remarks, Applicants contend that claims 3, 9-10, 17-18, 25-26 and 28-37 are allowable over Shimada. Reconsideration of claims 3, 9-10, 17-18, 25-26 and 28-37 is respectfully requested.

Claims 21, 27 and 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimada in view of U.S. Patent Number 4,409,428 granted to Dey et al. (hereinafter "Dey"). Respectfully we disagree.

When applying 35 U.S.C. §103, the following tenets of patent law must be adhered to:

(a) The claimed invention must be considered as a whole;

(b) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(c) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and

(d) Reasonable expectation of success is the standard with which obviousness is determined. MPEP §2141.01, *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1134 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

In addition, it is respectfully noted that to substantiate a *prima facie* case of obviousness the initial burden rests with the Examiner who must fulfill three requirements. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. MPEP § 2143, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Dey discloses an optical fiber joint for an overhead electric transmission system. The disclosure of Dey relates more to that of Shimada than to the immediate application. Dey does not teach or suggest melting of ice and is non-analogous art; thus it would not have been obvious to combine Shimada and Dey. However, even when combined, Shimada and Dey do not render claim 21 obvious.

Claim 21 depends from claim 15 and recites a second electrical conductor connected to the AC power source, wherein the first electrical conductor is connected to the AC power source, so that the AC power source energizes the first electrical conductor and the second electrical conductor at the same AC potential but 180 degrees out of phase from each other. Neither Shimada nor Dey disclose or suggest energizing a first and second electrical conductor at the same AC potential but 180 degrees out of phase from each other. For at least this reason, Shimada and Dey, alone or in combination, fail to disclose every element of Applicants' claim 21.

Claim 27 depends from claim 24 and further recites the step of separating the electrical conductor from the cableway system component using an electrically insulating spacer. There is no suggestion or motivation in the references or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings to render the instant invention obvious. As discussed above, Shimada's invention would be rendered inoperable by an electrically insulating spacer located between the conductor, 'high frequency applying coil 5', and the power transmission line. Shimada and Dey, alone or in combination, fail to render claim 27 obvious.

Claim 39 depends from claim 31 and recites the steps of applying the AC voltage to a second electrical conductor 180 degrees out of phase from the first electrical conductor so that an AC power source energizes both the first and second electrical conductors. Neither Shimada nor Dey disclose or suggest energizing a first and second electrical conductor at the same AC potential but 180 degrees out of phase from each other. For at least this reason, Shimada and Dey, alone or in combination, fail to disclose every element of Applicants' claim 39.

In view of the above remarks, Applicants contend that claims 21, 27 and 39 are allowable over Shimada in view of Dey. Reconsideration of claims 21, 27 and 39 is respectfully requested.

Conclusion

In view of the above Remarks, Applicants have addressed all issues raised in the Office Action dated December 30, 2004, and respectfully solicit a Notice of Allowance. Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

A Petition for an extension of one month is submitted herewith along with the requisite fee. Applicants believe no additional fees are due; however, if any fee is deemed necessary in connection with this Response, please charge Deposit Account No. 12–0600.

Respectfully submitted,

Date: 4/22/05

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